The aim of the animal welfare science update is to keep you informed of developments in animal welfare science relating to the work of the RSPCA. The update provides summaries of the most relevant scientific papers and reports received by the RSPCA Australia office in the past quarter. Email science@rspca.org.au to subscribe.
ANIMALS USED FOR SPORT, ENTERTAINMENT, RECREATION AND WORK

Exercise-induced pulmonary haemorrhage in Thoroughbred racehorses

Exercise-induced pulmonary haemorrhage (EIPH) is a highly prevalent disease of racehorses that consists of bleeding within the airways following a race. EIPH is associated with poor race performance and horse welfare, and horses will be banned from racing if they bleed from both nostrils after racing. This study monitored EIPH in Thoroughbred racehorses over time to determine whether the prevalence and/or severity of the disease changed, and if so, what contributed to these changes.

Australian Thoroughbred trainers were invited to enrol their horses in the study when racing at three racing tracks in Western Australia. Thirty minutes after a race, the horses’ airways were examined using an endoscope to check for blood. The airways of each horse were graded on a 0-4 scale (EIPH score), with 0 indicating no blood, and 4 indicating substantial amounts of blood present covering more than 90% of the tracheal surface. Horses could be assessed following multiple races, and data collection occurred over 2.5 years. Only horses that had been assessed at least twice were included in the study, resulting in a total sample size of 747 horses. Additional data were collected on the racing records for each horse, such as the number of races started, the temperature on race day, the days since the horse’s last race, and the weight carried.

The results showed that blood was detected in over half of all examinations (55.6%) and that the population prevalence of EIPH increased as the number of examinations for each horse increased. When comparing consecutive EIPH scores, the score was likely to increase on colder days, possibly associated with airway inflammation, and when the horse was carrying less weight. Horses may be given less weight to carry when they advance to a higher race class. The increased speed of the competitors combined with less weight are likely to result in more pressure on the airways. Horses received a lower EIPH score if they had had a longer break between races. The authors conclude that limiting the intensity of training and spacing race days for horses with EIPH may be beneficial for reducing the severity of this disease.


Retiring and replacing performing captive cetaceans

Seaworld was founded in 1959 and has since profited from its use of captive marine species such as dolphins and orcas for human entertainment purposes. These species are intelligent, have complex social structures, and would naturally roam vast distances in the wild. The substantial negative impacts of keeping these species, particularly orcas, in captivity were widely publicised by the release of the 2013 documentary Blackfish. This documentary criticised the policies and practices of Seaworld and other marine entertainment parks that severely compromised the welfare of its captive orcas and contributed to the deaths of four people. The resulting public backlash and collapse in share prices that followed the release of Blackfish are indicative of the change in public sentiment regarding the exploitation of intelligent animals for theatrical entertainment. This article from the UK discusses how Seaworld could use this situation as an opportunity to reform itself and provide peaceful retirement for its captive orcas.

Since the release of Blackfish, Seaworld has announced that it will cease its orca breeding program, replace its orca and dolphin theatrical shows with ‘viewing’ tanks, and build new and stronger partnerships with marine conservation organisations. However, Seaworld still possesses 29 orcas, 168 other whales and dolphins, and numerous other non-cetacean species such as sharks and sea lions. The continued use of these animals for ‘viewing’ purposes is still likely to result in welfare problems. As the orcas are unable to be released into the wild, the authors propose that Seaworld invest in sea-pens so that their orcas can be housed in much larger and more natural spaces without the close proximity of human crowds.

Sea-pens are expensive and cost up to $600,000/year to maintain. To generate the funds required to maintain these pens, the authors suggest that Seaworld invest in other forms of entertainment for its guests that do not involve animals. These include virtual reality amusement rides with underwater themes, and shows involving hologram orcas combined with human performers wearing aquatic jetpacks. Adopting these themes would allow Seaworld to maintain its unique selling point while adopting ethically neutral practices.

Ensuring the welfare of animals used in animal-assisted interventions

Animal-assisted-intervention (AAI) is defined as ‘any intervention that intentionally includes or incorporates animals as part of a therapeutic or ameliorative process’. The popularity of AAI has been increasing, and in the last decade there has been a surge of research in this area. Because humans are the subject of AAI, researchers may fail to recognise that the animal use should be approved by an animal ethics committee. This approval ensures that the welfare of the animals is monitored to ensure their needs are met. For example, animals may be regularly exposed to traumatised or severely disabled people and this may be stressful for the animal, or in rare cases may even be dangerous. This USA study reviewed published research articles involving AAI to determine how often they reported animal ethics approval, and to describe the animals used in these studies.

A comprehensive literature search identified 923 articles relating to AAI. These articles were reviewed to ensure they contained sufficient detail for analysis, resulting in 139 articles that were suitable. Each article was then assessed to determine: whether the study obtained approval from an animal ethics or human ethics committee; the species, number, age and sex of animals used; whether the animals had received AAI training, and whether the animals’ health or welfare was monitored during the study.

Of the 139 articles reviewed, only 14 (10%) reported obtaining animal ethics approval. This low rate may be because some studies had approval but did not report it, or because ethics approval was not applied for. More stringent reporting requirements by funding bodies and journal editors may encourage researchers to explicitly state when ethics approval has been obtained. Dogs were the most commonly used animal (65%), followed by horses (19%). Other details about the animals, such as the number used or their age, were inconsistently or rarely reported. In conclusion, the lack of ethics approval in AAI studies indicates that this field is underutilising this method of monitoring animal health and welfare.

Improving our understanding of assessing pain in horses

Unlike humans, animals cannot verbally describe the pain they experience. Researchers must rely on behavioural and physiological indicators to determine the location and severity of pain in animals. Objective and reliable pain recognition is essential in treating horses, allowing analgesics to be tailored to individual differences in the amount of pain experienced. This article discusses the current pain scales that have been published for horses in terms of design, validity and limitations.

A pain scale is a rating system in which the appearance of a horse is rated using numbers, with a higher total score indicative of greater pain. Currently, composite pain scales and facial-expression based pain scales appear to be the most promising tools for pain assessment in horses. Composite pain scales include multiple variables, such as different behaviours and physiology, which are individually scored and then summed to obtain an overall composite pain score. These assessments can be time consuming but can be very useful in clinical settings when assessing acute pain.

Facial expressions can be used as valid indicators of emotional states in horses. Facial-expression based pain scales are used to score features of the face and head to create a total pain score. Facial indicators of pain include the ears being held back, and tense muscles around the mouth, nostrils and eyes. One scale also includes head movement such as teeth grinding and yawning. These facial expressions only take two minutes to assess, thus providing a promising tool for valid and quick assessment of acute pain in horses. Further research should investigate the impact of individual personalities and coping styles on the behavioural indicators of pain, and recent improvements in digital technology may enable automated recognition of more subtle indicators of pain. Improved pain scoring could refine the criteria used to evaluate the clinical efficacy of new analgesic drugs and techniques, potentially benefitting horse welfare.


Cumulative bone fatigue in Thoroughbred racehorses

The forelegs and joints of racehorses are subjected to extremely high loads during galloping. Subchondral bones act as shock absorbers beneath the cartilage in joints, and the high loads experienced during racing and training can lead to bone fatigue and microcracks in the subchondral bone of the forelegs. These microcracks may extend into the surrounding bone to form larger fractures, with catastrophic consequences. Subchondral bone injuries are very difficult to treat, thus a better understanding of the factors leading to bone fatigue will aid in developing preventative strategies. This study investigated the relationship between training history and the occurrence of subchondral microcracks in Thoroughbred racehorses.

Subchondral bone samples were collected from the forelegs of 46 Thoroughbred racehorses at post-mortem. The cause of death of these horses was not stated. These bone samples were subjected to two types of scanning (microcomputed tomography and light microscopy) to determine the nature and number of microcracks present. The racing and training histories of each horse were obtained from online records and from discussions with the horses’ trainers. Horses were classified as being in race preparation if they had been exercised in the week prior to sample collection, or at rest if they had not been exercised in the previous week. The training history of the horse was then compared to the bone microdamage data.

Bone fatigue is prevalent in Thoroughbred racehorses with microcracks detected in each of the 46 horses sampled at post-mortem. Microdamage became more extensive as the racing career progressed, and the authors discuss how this effect is likely to be due to the strain of training rather than an effect of age. Damaged bone can heal if given sufficient rest, and accordingly the microdamage was greater in horses that were in training rather than at rest. To reduce the incidence of microdamage to subchondral bone in racehorses, the authors recommend that the intensity and duration of racing training be reduced, or alternately, the duration of rest periods be increased.

Assessment of quality of life and chronic pain in dogs

The assessment and management of chronic pain and quality of life (QOL) in dogs are key aspects of clinical veterinary practice. These assessments are essential for making good treatment decisions and advising owners. Chronic pain serves no function, but may be difficult to recognise and can seriously impact the QOL experienced by the patient. QOL refers to the aspects of an animal’s life that make that life better or worse for that animal. Chronic pain and QOL are closely related, and improvements in one may lead to improvements in the other. This UK article reviews this relationship, and provides guidance for recognising signs of chronic pain or poor QOL in dogs.

Chronic pain is typically recognised through changes in the behaviour of dogs, such as posture, temperament, vocalisation or movement. The behavioural signs of chronic pain may vary with the type of pain, and due to individual variation such as past experience, environmental factors, or personality. For these reasons, behavioural signs of chronic pain may be subtle and require a good knowledge of how each individual dog usually behaves under specific conditions. In comparison, QOL assessments are less tangible, in that they are attempting to assess the sum of all experiences that the dog is experiencing to determine how the dog ‘feels’. There is no single, validated test for QOL, and veterinarians must make a holistic ‘best guess’ based on the behavioural signs of physical and mental health in dogs, as well as their environmental conditions.

Assessments of chronic pain and QOL should be pro-active, global, regular, applied to answer specific questions for researchers and decision makers, and transparent about what has been assessed. This will help veterinarians and researchers to consider the overall impact of a condition on the animal, such as side effects and co-morbidities, as well as to help monitor changes in individuals over time. Relying on owner reports of pain may not be reliable. Further research into the relationships between chronic pain and QOL should be prioritised.

The status of pet rabbit breeding and online sales in the UK

Rabbits are the third most popular pet in the UK, and yet little is known about the pet rabbit population in this country or where the rabbits come from. Previous research has revealed that rabbit owners often don’t provide the minimum requirements of care for their pets, such as sufficient space, social companionship or healthcare. This raises concerns for the breeding stock used to supply the pet rabbit industry, as almost nothing is known about this population. Unlike laboratory and farmed rabbits, there are no guidelines in place to safeguard the welfare of these animals. This study investigated the conditions of rabbits in the pet breeding trade, and the demographics of the UK rabbit sales market.

Several methods were used to collect data on the pet rabbit breeding population in England. Basic husbandry and housing information was gathered using an online survey targeting pet rabbit breeders and received 33 responses. Online sales of pet rabbits were monitored for one month to gather information on the types of rabbits being sold. A freedom of information request was sent to 10% of English councils to determine what the legal licensing requirements were for pet rabbit breeders, and how they varied between councils.

During the one-month observation period, 1910 advertisements for pet rabbit sales were recorded. 74% of these adverts were for young rabbits (< 16 wks), and the authors used these figures to estimate that over 250 000 young rabbits may be sold online in the UK each year. The most commonly advertised breeds were Mini-lops and Netherland Dwarfs, which are susceptible to health problems. The breeder questionnaire also raised concerns about the housing of rabbit breeding stock. Most breeding animals were housed individually, with some breeders providing less space than that required for laboratory rabbits, particularly for males. Only 1% of pet rabbit breeders were licenced. The licensing requirements varied between different councils and were not sufficiently clear for practical use. The authors conclude that standardised guidelines must be created for pet rabbit breeders to ensure the minimum requirements of care are met for their animals.


Identifying negative responses to restraint in cats

There are over 100 million pet cats in the USA and Canada, with many of these animals requiring restraint during routine veterinary check-ups and procedures. One study found that 30% of cats show fear and aggression during these procedures, resulting in 24% of examinations that could not be completed and potential misdiagnoses. The potential for negative health and welfare consequences of excessive restraint in cats is becoming increasingly recognised, but there are no scientifically validated measures available for assessing the level of aversion experienced by the cats. This study investigated indicators of negative responses to handling in cats.

An experiment comparing the effects of full bodily restraint against light minimal restraint during a veterinary examination was conducted at an animal shelter in Canada, using 51 adult cats. All cats were tested for friendliness using an Unfamiliar Human Test and were classified as ‘friendly’ if they voluntarily emerged from a cat carrier and approached within 50cm to an unfamiliar human sitting on a chair, and then allowed that human to approach and pat them. If they showed any avoidance of the human then they were classified as ‘unfriendly’. Following this test, each cat was then carried to a second room for a 2 minute physical examination that measured heart and respiration rate, as well as ear temperature. The cats were restrained either using full body restraint (held completely flat and immobile on the table) or passive restraint (cat remains in their preferred posture and can move somewhat). The behaviour of the cats was observed during and after the examination, and their eyes photographed for pupil measurement.

Several behavioural and physiological differences were identified between the two types of restraint. Cats receiving full restraint showed more struggling, lip licking and flattened back or sideways ears. They also showed increased respiratory rate and pupil dilation, consistent with a stress response, and jumped off the examination table faster than the passively restrained cats. These measures are all indicative of an aversive experience for cats and are considered suitable for use in identifying a negative handling experience for cats.

The impact of the Cat Tracker citizen science project in South Australia

Cats are a popular pet worldwide but their outdoor access must be managed to avoid substantial predation on native wildlife and other negative impacts. A novel method of engaging cat owners with pet cat management was to include them in a citizen science project that tracked the movements of their pet cats while roaming outdoors. Citizen science involves public contributions to organised research projects, where members of the public volunteer their time to assist scientists with data collection. This arrangement is mutually beneficial, with many citizen scientists finding this work rewarding and educational, however the full extent of the impact of citizen science projects on citizens has not been explored. This study measured the impacts of the Cat Tracker project on the volunteers that participated.

The Cat Tracker project was a well-publicised study that took place in South Australia. The public were invited to complete an online survey about cat ownership, cat personality, attachment to cats, cat management, and participant demographics. This survey received 3192 responses, of which 428 participants were selected to have their cats tracked for one week using a GPS harness unit. To evaluate the impact of the project on the participants, an evaluation survey was sent to owners regarding what they had learned, their cat management practices and their attitudes to cats. This evaluation survey received 410 valid responses and was compared to the initial survey to determine how participation had changed the behaviour and attitudes of cat owners.

The majority of participants were educated women in their 50s. Participants that were most involved with the project were most influenced by it; all cat owners increased the importance they placed on confining their pet cat, but this increase was greater for people who had had their cats tracked. Most people stated that they would keep their pet cats indoors more after participating, even though the project did not specifically advocate this behaviour. The authors conclude that citizen science projects can benefit participants and onlookers by improving their knowledge, attitudes and behaviours toward the study subject.

Welfare-Adjusted-Life-Years: A novel measure of animal welfare

Disease can compromise animal welfare and cause premature death, but the effect of disease on these two parameters are measured separately. For example, many disease studies focus on survival times, without acknowledging that poor welfare can occur without the animal dying from the disease. In human medicine, the burden of disease caused by premature death and impaired health can be measured by a single metric called the Disability-Adjusted Life Year (DALY). This study adapted the DALY for use with animals to create a new metric; the Welfare-Adjusted Life Year (WALY).

WALY is the sum of two components: the number of years lived with impaired welfare (YLIW) due to a particular cause, and the estimated number of years of life lost (YLL) due to premature death from the same cause. To demonstrate the use of WALY, 10 common diseases in dogs were selected and their welfare impediments were identified. For example, mitral valve disease will cause mild-severe heart failure, frequent veterinary visits (which may be stressful for fearful animals), and death. Welfare impediments caused by treatments and complications of the disease were also considered. The severity of each welfare impediment was weighted based on the opinions of 61 veterinarians recruited at a veterinary conference in Australia.

The authors were successfully able to apply the WALY to 10 common diseases in dogs, and this is the first time that this sort of metric has been calculated. The welfare impediment that was given the least weight was “amputation: one limb”, while the welfare impediment that was given the most weight and considered the most severe was “respiratory distress”. The disease that received the lowest WALY value was thoracolumbar intervertebral disc disease (2.83), while the highest WALY was allocated to atopic dermatitis (9.73). The greater the WALY value, the greater the adverse impact of the disease on the dog. These results demonstrate that the WALY metric is able to summarise the welfare compromise as perceived by humans and the total impact of diseases on individual animals.


Reptilian and mammalian brains are molecularly similar and share evolutionary origins

In all developing bird, reptile and mammal embryos, the brain begins developing with the same regions, but by the time these animals reach adulthood these regions have differentiated into very different structures for mammals and reptiles. For example, the neocortex is only present in mammalian brains and the dorsal ventricular ridge is only present in birds and reptiles. These different structures perform similar roles and are involved in higher brain functions. It is known that mammals and reptiles shared a common ancestor about 320 million years ago, and it is of interest to know how the reptilian and mammalian brains diverged since this common ancestor. This study examined gene expression data from reptilian and mammalian brains to study the evolution of neuronal diversity in these animals.

Samples of brain tissue were collected from three different areas within lizard, turtle and mouse brains, and this tissue was genetically sequenced to determine which genes were being expressed in the different brain regions. Regions that expressed the same genes were considered to be similar, even if they were not in the exact same physical location between the different types of animals. These regions were then compared between the progenitor species (lizard and turtle) and the descendant species (mouse and human) to elucidate whether some shared features were present in the brain of the common ancestor (320 million years ago), or had evolved concurrently since mammals and reptiles diverged.

These analyses provide support for the concept that many brain regions found in mammals were probably present in the common ancestor 320 million years ago. These include homologs on the mammalian neocortex, ‘core’ hippocampus, claustrum and pallial amygdala. This suggest that mammalian and reptilian brains diversified by expansions and independent evolution of different regions in the grey and white matter (the pallium). These expansions coincided with the evolution of new types of neurons in mammals. This paper does not discuss how the similarities and differences between mammal and reptile brains may affect their sentience, and thus their capacity to suffer, but does pave the way for future studies of the evolution of brain function.

Shelter housing for cats: Principles of design for health, welfare and rehoming

The design of an animal shelter and the housing within will affect both the success of the organisation and the experience of each animal that passes through its care. Cats are particularly susceptible to environmental change, and poor housing in shelters can negatively impact both their health and welfare. This article reviews the practical aspects of shelter design for optimal cat health, welfare and adoption rates.

The number of cats that can be housed by a shelter at any one time must be carefully considered. Ideally, a shelter will hold a relatively small population of cats, but each cat will be adopted quickly so that a high throughput is maintained. Research has repeatedly shown that doubling the cage size (and consequently halving the shelter population) results in a range of benefits for cats, such as increased adoption rates, improved health, reduced veterinary costs and less time spent at the shelter. In addition, having fewer cats on display also improves adoption rates.

Shelter housing should be designed to accommodate the specific needs of cats to ensure optimal welfare. Cats are solitary, territorial predators and require privacy and an elevated resting place. Group housing is not recommended. The indicators of stress in cats are subtle, and their behaviour should be monitored carefully for signs of stress of that the environment needs adjustment. For example, a cat resting in its litter tray may need a more comfortable or more private resting place. Providing environmental enrichment not only benefits cat welfare, but has been associated with improved adoption rates, presumably due to the cats being more relaxed and likely to interact positively with adopters. Disease control is an ongoing concern as cats are more likely to become sick when stressed, particularly with upper respiratory tract infections. Optimal housing with enrichment can be more difficult to disinfect but can improve the immune function of cats by reducing stress. In conclusion, optimal housing for cats in shelters can improve adoption rates, reduce stress, improve the cat welfare, and provide a more pleasant working environment for shelter staff.

Rearing male layer chickens: A German perspective

The negative relationship between egg production and fattening performance in chickens has resulted in specialised strains for egg and meat production. The egg industry produces large numbers of male chicks each year that are killed at one day old because they serve no economic purpose. This article discusses the current developments to avoid killing male layer chicks in Germany.

There are currently three different methods available to avoid the killing of male chicks in the egg industry. The first is in ovo sex determination. This method involves sexing the eggs using endocrinological or optical methods and destroying the male embryos prior to hatch. This system is 98% accurate by the ninth day of incubation and is commercially available in Germany. The second method involves the use of dual-purpose breed. Hens from these lines lay a sufficient number of eggs, while the males have an acceptable fattening performance. Using dual-purpose breeds allows females to be used for egg production and males to be fattened for meat production. However, these breeds will never achieve the high production rates of the specialised breeds and are not yet available on a commercial scale in Germany. The final method is to rear the males of specialised egg production strains for meat production.

Rearing males for meat production is currently being used by the organic sector as an interim method while dual-purpose breeds are in development, as in ovo sex determination is not considered acceptable to this sector. The number of male layer chicks raised in Germany has increased from 100,000 per year in 2015 to 270,000 per year in 2018. These birds take 8.5 to 18 weeks to reach a marketable weight. In terms of animal welfare, rearing male layers is largely unproblematic, and 89% of the German consumers would be willing to pay more for eggs if the male chickens were raised. While there are challenges in raising male chickens in a resource-friendly and ecologically sustainable manner, this practice serves as an example of how an industry can react to societal concerns immediately, before longer-term solutions are available for the entire system of modern poultry production.


Reducing sow confinement at 3 days post-partum may not be detrimental to piglet survival

Farrowing crates are used to prevent the sow crushing young piglets as she changes posture. This protection is generally most necessary during the first 3 days after birth. Temporary crating is a procedure in which the farrowing crate is opened when the piglets are 3 days old, allowing the sow to move about within the farrowing pen. The effect of temporary crating on the sow and piglets is currently unknown; the greater freedom of movement may improve sow welfare but may also increase the risk of piglet crushing. This study investigated the effects of temporary crating on the behaviour and physiology of sows, and the performance of their piglets.

An experiment was conducted at a research farm in the Czech Republic using 27 sows. All sows were placed into farrowing crates prior to parturition, and half of these sows had their crates opened at Day 3 postpartum (the treatment group). The remaining sows acted as the control group, and their crates remained closed throughout the lactation period until weaning at Day 28. Sow and piglet behaviour was monitored on Days 3, 4 and 25 using overhead video cameras. Saliva samples were collected on Days 2, 4 and 25 for analysis of stress hormone (cortisol) and immune function (IgA). Piglet performance was assessed using mortality rates and weight gain.

The temporarily crated sows showed no differences in cortisol, but a decrease in IgA on the day after the crate was opened (Day 4). The decrease in IgA may indicate a reduction in sow stress. The temporarily crated sows also showed increased activity after the crate was opened on Day 3. There was no difference in the mortality rate, growth rate or behaviour of the piglets, indicating that the additional activity shown by the sows on Day 3 did not pose a risk of crushing to the piglets. In conclusion, temporary crating limited to the first 3 days postpartum may be a feasible alternative to improve sow welfare under intensive production conditions.

The effect of UV light on broiler chicken welfare

For animals that are housed indoors such as broiler chickens, the quality of artificial lighting can influence their behaviour and welfare. Chickens can see ultraviolet (UV) light that is imperceptible to humans. Providing UVA light, part of the UV spectrum, appears to make the environment more attractive as it encourages foraging activity and preening while reducing fearfulness and stress. In addition, UVB light supports the synthesis of vitamin D, which increases bone strength. This UK study investigated the effect of providing artificial UVA and UVB light on broiler chicken welfare.

638 broiler chicks were randomly assigned to one of three lighting treatments: UVA light only for 18hrs/day; UVA and UVB light for 8 hrs/day; or standard LED light with no UV wavelengths (control). The UVA+UVB treatment needed to be limited to 8hrs/day to avoid overexposing the birds to UVB. Each treatment group was housed in a separate room until 35 days of age when the experiment ended. Three measures were used to assess the welfare of each treatment group; feather condition, fearfulness and walking ability. The feather condition of each bird was assessed at 24 days old using a 5-point scoring system. A sample of 100 birds per treatment were tested for fearfulness at 29 days old using the duration of tonic immobility after gentle restraint. Walking ability was assessed for half of the birds using a 5-point scoring system at 31 days of age.

The results suggest that UVA and UVB light may offer potential welfare benefits to indoor reared broilers. The UVA+UVB treatment led to improved walking ability and a tendency to be less fearful. UVA led to reduced fearfulness, improved walking ability and improved feather condition in male broilers. Installing UV lights in broiler farms has the potential to improve the welfare of indoor reared broiler chickens.

Testing a non-penetrating captive-bolt system for piglet euthanasia under commercial conditions

On pig farms, piglets may need to be euthanased for a variety of reasons. A common method for killing piglets is manual blunt force trauma to the head using a heavy instrument or by swinging the piglet against a hard surface. This method is heavily dependent on the strength and skill of the stockperson, and is aesthetically unpleasant to perform. An alternative method is the use of a captive bolt device. The Zephyr EXL is a type of non-penetrating captive bolt gun which is fired against the piglet’s head. This model of captive bolt gun has been shown to cause immediate death in piglets under laboratory conditions. This study investigated the efficacy of the Zephyr EXL for piglet euthanasia under commercial conditions.

The research was conducted on a commercial pork farm in the USA. Standard farm procedures were used to identify 207 piglets that required euthanasia. Each piglet was individually restrained in a restraining device, with their head held firmly against a hard surface. The Zephyr EXL was administered to the frontal-parietal position of the head, and each piglet was then monitored for three minutes for signs of sensibility. After death was verified, the head of each piglet was removed, labelled and frozen for brain dissection. Dissection allowed the extent of brain trauma to be determined. A second trial was conducted at the same farm using 106 piglets to determine the speed of the method under commercial conditions.

The Zephyr EXL caused immediate loss of consciousness and brain death in all piglets, and it took less than 7 seconds to select, place and euthanase a piglet using the device. Brain dissection revealed substantial physical damage to the skull and brain of piglets following administration of the Zephyr EXL. Some piglets showed signs of agonal gasping or clonic movements following application, to which the stockpeople expressed concern. However, once the researchers explained that the animals were not conscious, their concerns were abated. These results, combined with the results from the previous laboratory study, led the authors to recommend the Zephyr EXL as suitable as a single application euthanasia device for piglets up to 10.9kg liveweight.

Management of cull dairy cows in Canada

Around one third of dairy cows in Canada and the US are culled each year, usually because of poor health or production. Culled cows are removed from the herd and transported to slaughter, and for cattle that are already in poor health, this process may result in poor welfare. In addition, many slaughter plants do not accept dairy cattle for slaughter, and consequently cull dairy cattle may be transported long distances to reach an appropriate slaughter plant. While there are many apparent risks to the welfare of cull dairy cattle, this topic has received little scientific attention. This article discusses the diverse management of cull dairy cows in Canada, and possible improvements that could be made.

Due to the lack of scientific literature on this topic, a panel of 15 experts was convened over 2 days to discuss regional management practices, risk factors, welfare problems, and recommendations for cull dairy cow welfare. The experts consisted of farmers, veterinarians, regulators, researchers and people involved in the transport, sale and slaughter of cull dairy cows.

The 8 main themes arising from the meeting are summarised in the following: 1. Cull dairy cows may take up to 10 days to reach slaughter due to various delays and auctions. Research is needed to better understand what delays these cows experience and why. 2. Farmers and herd veterinarians need greater awareness of how long it takes a cow to reach slaughter. 3. Pro-active culling should be promoted to prevent poor welfare and improve the commercial value of the carcass. 4. Cattle should be assessed for fitness-for-transport prior to loading due to the likelihood of poor health. 5. Local options for slaughter plants that accept cull dairy cows should be promoted. 6. Cull dairy cow management varies between jurisdictions. Options such as mobile slaughter should be investigated. 7. Farmers need training in making on-farm euthanasia decisions. 8. Consistent enforcement of the relevant regulations could help to address welfare problems and create public confidence. These insights into cull dairy cow management can be used to guide research to aid policy decisions in this area.

Emotions and ethical decision-making in animal ethics committees

In the European Union, research projects that use animals must be evaluated and approved by an animal ethics committee (AEC). This committee weighs the expected benefits of the research against the harms imposed on the animals to decide whether the research should be approved. In Sweden, each AEC consists of one chairperson, a deputy chairperson, six scientific representatives and six laypersons. The scientific representatives allow the research proposals to be assessed for scientific rigour, while the laypersons represent the views of society in relation to acceptable animal use. These committees have been criticised for dismissing or minimising the views of the laypeople for being too emotional. This study investigated whether differences exist between different categories of AEC members, particularly in terms of using reason and emotions to make ethical decisions.

An online survey was distributed to AEC members in Sweden, containing questions about the experiences working in the committee, how they perceived the ethical decisions to be made, and how their emotions influenced their ethical decision making. This survey received 74 useable responses. In addition, detailed telephone interviews were conducted with eight people who had previous experience with animal research and ethical evaluation but had not been involved in the online survey. These qualitative interviews helped to elucidate some of the key findings from the survey in more detail.

Laypersons on the ethical committees felt that they held less influence in ethical decision making than the scientists. The laypersons also reported more emotional involvement in the decision-making process, whereas the scientists relied more on utilitarian reasoning. The authors argue that emotions such as empathy are the very basis of morality, and it appears illogical to actively disregard them in moral deliberations. It is recommended that the chairpersons of AECs be trained in facilitating equal discussion between the members, and clearly define the roles of each member. It is only when laypeople feel equal in the discussion that they truly fulfil their task as society’s representatives. AECs should also consider other ethical models besides the standard utilitarian approach to achieve a more thorough, balanced and inclusive ethical evaluation.

Public concern for farm animal welfare has been increasing over the last 50 years due to a combination of increased awareness of animal sentience, the intensification of animal agriculture, the increasing urbanisation of societies, as well as a tendency to anthropomorphise. Understanding which specific welfare concerns are most prominent among members of the public is critical to improve processes in the meat production industries. This study examines the public’s concern for the welfare of sheep and cattle during transport.

The views of the Australian public regarding livestock transport were collected qualitatively using a combination of focus groups (27 people) and ‘mall-intercept interviews’ (39 people). Both focus groups and interviews were structured and included a series of discussion points about the welfare of sheep and cattle more broadly, with this paper focusing on the responses relating to transport by land or sea. Participants were not asked explicitly about particular production practices (e.g. transport) but were asked open-ended general lines of questioning to determine what topics were of most concern to the participants. For example, the researchers asked the participants to describe what images came to mind when they thought of the sheep and beef industries, rather than asking them what they thought of specific practices.

Participants were required to be regular consumers of meat to participate, and were recruited through community and social media announcements, and public events.

A recurring theme expressed by participants was concern for livestock during transport by road and sea. Participants described concerns for the animals being ‘packed in’ tightly to the trucks and transported for long distances, and these aspects of transport were perceived to have a negative impact on animal welfare. This recurring theme may have been due to the high visibility of livestock transport vehicles in urban areas, combined with the extensive coverage of the live-export industry in the media. Public concern for transported animals may also be driven by anthropomorphism, the inevitable connection between transport and slaughter, and a genuine concern for animal welfare. The results of this study suggest that the red meat sector may need to reconsider some of their transport practices to better align with community expectations and current animal welfare science.

Combining conservation and animal welfare to create ‘conservation welfare’

Conservation biology and animal welfare science both aim to improve the lives of animals. However, there has been very little collaboration between the two fields and to some extent, they have been in opposition. For example, welfare scientists prioritise the welfare of the individual and consider particular conservation practices to incur suffering, such as the hot iron branding of seals for research purposes. In contrast, conservation biologists prioritise the welfare of the population and consider branding to be a necessary practice to allow population monitoring. Attempts by welfare scientists to end or replace this practice are viewed as stymieing conservation efforts, and conflict ensues. This paper summarises the main points regarding the scientific assessment of wild animal welfare and the barriers to progress.

A facilitated discussion between conservation biologists and animal welfare scientists was conducted during a one-day workshop at a conference in New Zealand. There were 14 participants, comprised of welfare scientists, conservation scientists, NGO representatives, wildlife veterinarians and wildlife rehabilitators. The purpose of the workshop was to explore the various roles of science in developing a new field called ‘Conservation Welfare’, in which conservation biologists and welfare scientists could work collaboratively to progress both conservation and welfare of wild animals.

The dominant theme emerging from the workshop was the need for a common language. In conservation biology, welfare is often equated with ‘fitness’; that is, the ability of the animal to survive and reproduce, thus contributing to a viable population. For animal welfare scientists, welfare relates to the ‘feelings’ of an animal, and its capacity for positive or negative experiences. Focusing only on mortality or reproduction rates is unlikely to fully encompass the wide range of suffering that wild animals can experience, and a common understanding of what animal welfare is must be achieved before progress can be made. Following this, inconsistencies in animal welfare legislation must be addressed. For example, many pest species are exempt from animal welfare consideration, particularly in relation to lethal control methods. To facilitate constructive collaboration between the two fields, the formal development of a new discipline, ‘conservation welfare’, is proposed.


Using virtual fences to reduce the amount of roadkill on Tasmanian roads

Wildlife roadkill is a welfare, environmental and economic issue. The combination of abundant medium-sized nocturnal macropods with narrow windy roads with high speed limits has led to Tasmania having Australia’s highest incidence of wildlife roadkill. Animals have insufficient time to detect oncoming vehicles, and drivers have limited time to respond to wildlife on the road. This is of particular concern for Tasmania’s unique and endangered species, such as the Tasmanian devil, with 300-450 devils killed on roads every year. This study trialled a virtual fencing system as a potential method to reduce wildlife roadkill.

The virtual fencing system involves a series of devices mounted on poles at 25 metre intervals along the roadside. When these devices detect the oncoming headlights of a car at night they emit an audible siren, as well as flashing blue and yellow lights. This system is designed to alert wildlife to the presence of an approaching vehicle in time for them to move away from the road. The virtual fence was installed along a 3 km stretch of Tasmanian road, which was later extended to 5km. The number and type of roadkill on the ‘fenced’ section (5km) and ‘unfenced’ sections (8km) of the road were monitored daily for 3 years. Roadkill rates were also monitored for 4 months prior to the virtual fence being installed.

The total roadkill rate was reduced by 50% after installation of the virtual fence, suggesting that these devices have enormous potential to substantially reduce roadkill rates. The total roadkill rate for the most commonly struck species, Bennett’s wallaby, was significantly reduced from 120 to 38 and from 218 to 49 for the pademelon. The roadkill rate for the Tasmanian devil was reduced from 14 to 5, which is promising for this endangered species. The success of this virtual fencing trial should support the roll-out of this technology at other identified roadkill hotspots in Tasmania to help protect wildlife.

Wildlife welfare associated with veterinary treatment

Wild animals are often faced with multiple threats, including disease, predation, and anthropogenic threats such as vehicle collisions and habitat loss. Increasing pressure on wildlife appears to be increasing admission rates to hospitals, but little is known about the extent and role of private veterinarians in treating and rehabilitating wildlife. This study investigated the extent, costs, demands and expectations of private veterinary practice treatment of wildlife in Australia.

The public phone directory was used to systematically search all towns and cities in Australia for veterinary clinics, resulting in 902 clinics with valid email addresses. These clinics were emailed an online questionnaire containing questions about: veterinarian demographics, the types of wildlife seen, the resources available for wildlife treatment, the cost and time required to treat wildlife, the outcomes of treated wildlife, the availability of wildlife carers, and the need for further education in this area. The questionnaire received 132 responses.

The most important constraint on treating wildlife was a lack of knowledge and lack of time. This resulted in only 20% of wildlife being examined immediately on admission, with most wildlife only being seen when the veterinarian had a spare moment. The cost of treatment was only a barrier in some clinics, with most clinics rarely receiving reimbursement for their wildlife work. Birds were the most common type of animal admitted to clinics, followed by marsupials, reptiles, non-native animals and amphibians. 82% of wildlife presented to veterinary clinics was for trauma, including vehicle collision and predation. Most clinics saw less than 10 wildlife cases each week, and this figure was extrapolated to create an estimated annual caseload of 178,000 – 355,000 wildlife patients in New South Wales alone. The most common outcome for wildlife was rehabilitation with a wildlife carer. In conclusion, private veterinary practices play a significant role in wildlife treatment and care, and the estimated annual caseload was much higher than previously thought. The development of educational resources to aid veterinary assessment of wildlife should be considered.

ARTICLES OF INTEREST

ANIMALS USED FOR SPORT, ENTERTAINMENT, RECREATION AND WORK


Cats


Exotic pets


General


FARM ANIMALS

Cattle


Pigs


**Poultry**


**Rabbits**


**Sheep/goats**


**General**


**HUMANE KILLING**


**MISCELLANEOUS**


**RESEARCH ANIMALS**


**TRANSPORTATION OF ANIMALS**


**WILD ANIMALS**


